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ABSTRACT

A simple introduction to the techniques of simulation and gaming is offered, and several simulation/gaming applications are differentiated--non-simulation games, planning exercises, inter-personal simulation games, and large system simulation games. A chart compares various simulation/gaming applications for a large number of learning characteristics. An annotated bibliography lists both basic references and material for more experienced users of simulation/gaming. A directory gives the names and addresses for over 50 groups involved in a simulation/gaming and describes each group's status, activities, level, and focus. (JY)

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An ERIC Paper

EDUCATIONAL SIMULATION/GAMING

By Paul A. Twelker and Ken Layden

United States International University
Corvallis, Oregon

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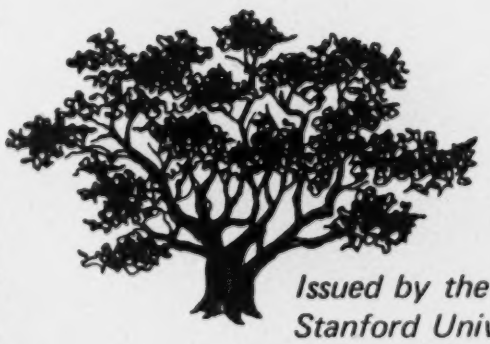

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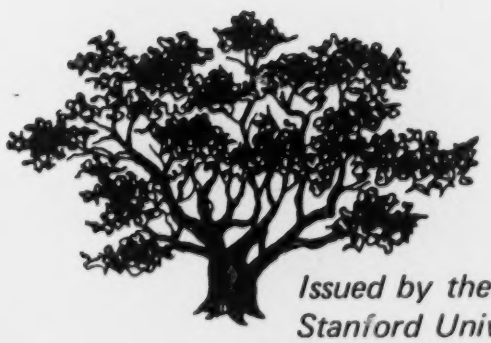

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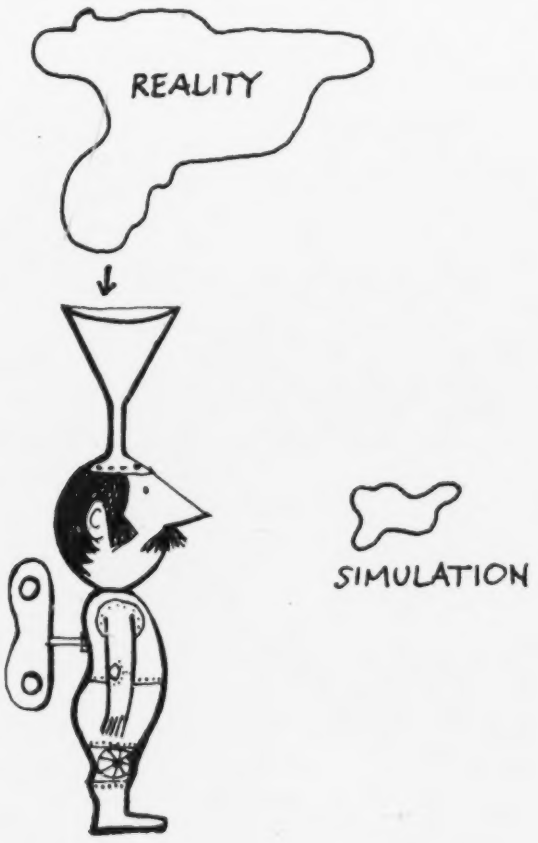
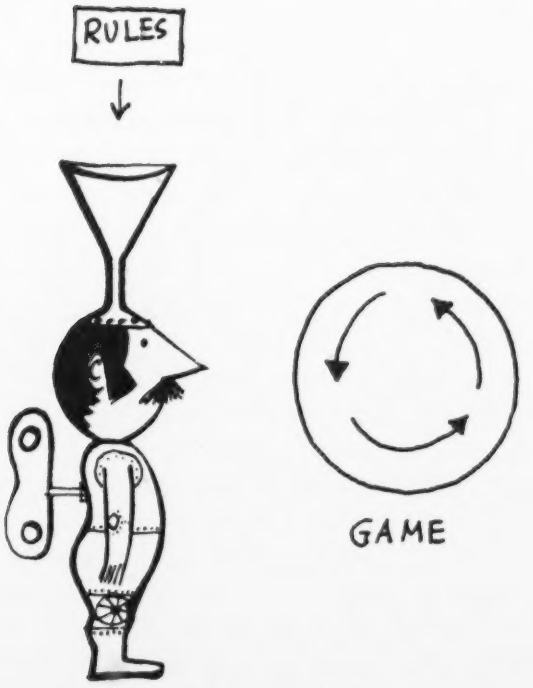
I. SO YOU DON'T KNOW FROM NOTHING?

What is simulation? What is gaming? What is educational simulation/gaming anyway? Educational simulation/gaming combines two basically simple ideas:

Simulation — Simulations are simplified reality—the essence of physical or social systems of interaction. Simulations attempt to replicate essential aspects of reality so that reality may be better understood and/or controlled. Reality is replicated to the degree that the simulation designer selects essential elements from reality.



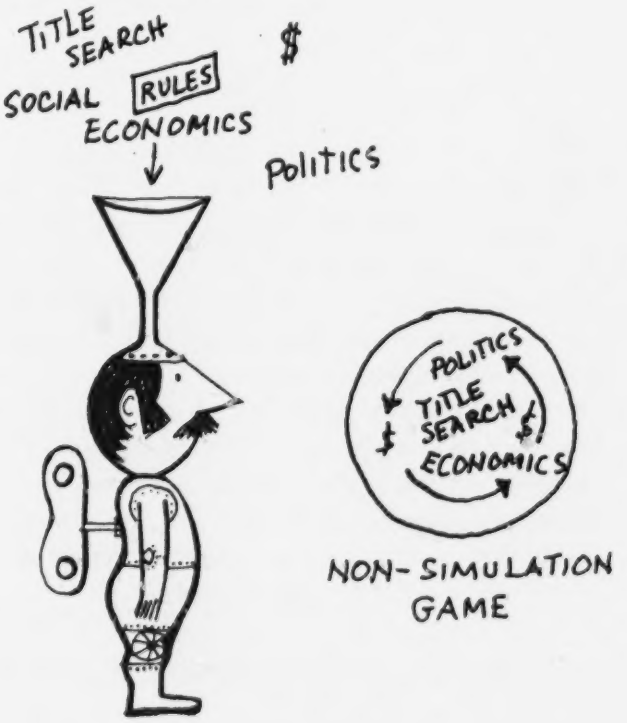
Gaming — Games are competitive interactions among participants to achieve pre-specified goals. These interactions may feature cooperation within groups, but competition either among individuals or groups distinguishes gaming. Games are usually played for entertainment and clearly identify winners and losers. Participant success is dependent upon skill or chance or some combination of the two. Games make no attempt to replicate real world behavior—rules of behavior for the game need apply to the game only.



From these two ideas—simulation to represent elements of reality and gaming to stimulate interaction—have been developed a variety of powerful learning contexts commonly known as educational simulation/games. These may be distinguished by the particular combinations of simulation and gaming that they employ to facilitate different learning outcomes.

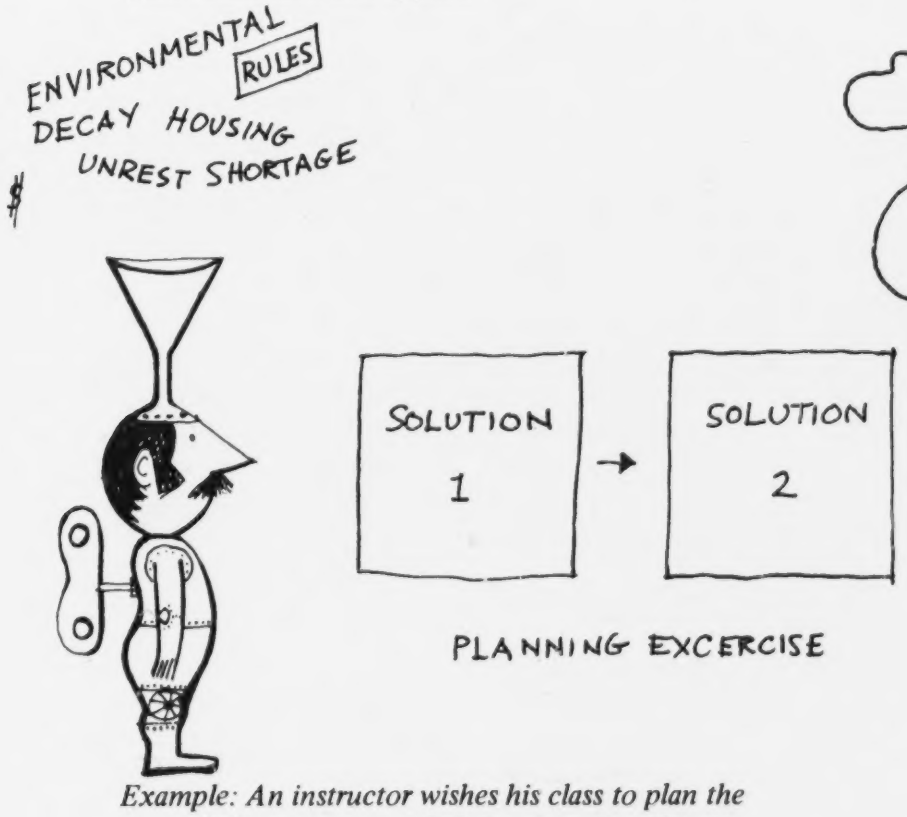
Although the following may not represent mutually exclusive categories, they do serve to differentiate among the variety of simulation/game applications being presented to educators for use.

- **Non-simulation games** are competitive learning contexts in which participant success is determined by the degree of subject matter comprehension—of information, concepts, generalizations, and/or theories—demonstrated during game play.



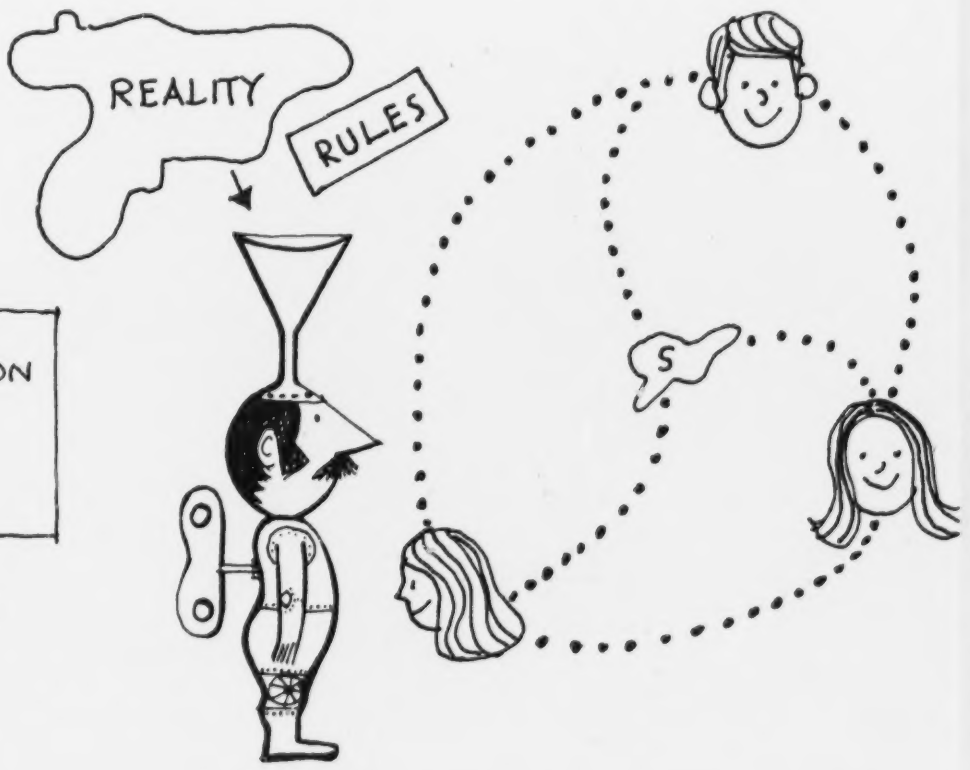
Example: An instructor wishes students to learn and be able to recall basic concepts discussed in urban planning. He devises a non-simulation game organized around the political, economic, and social sectors involved in urban planning. In turn participants must draw a card, each with an activity specific to a particular sector, identify the sector appropriately, and provide an example of the activity in use. Points are allocated for correct responses, and the highest scorer at the end of time is the "winner."

- **Planning exercises** are non-simulation games which focus on process rather than content by engaging the participant in the examination of selected social problems requiring solution. Committees cooperate in discussion and each proposes solutions which are in competition for adoption by the entire group after evaluation criteria have been established and applied.



Example: An instructor wishes his class to plan the use of the core area of their own city. How to proceed? Planning teams are formed–each to draw up a comprehensive plan of attack. One group, known as evaluators, represents a cross-section of interests: environmentalists, businessmen, city bureaucrats, community service people, etc. Activity proceeds through the following phases: planning–of proposals by the planning teams and evaluation criteria by the evaluators; reporting of proposals; and judging of proposals.

- **Inter-personal simulation games** are learning contexts in which the participant responds within the simulation game as if he were in the actual system of interaction being simulated. Interaction is structured by rules and physical circumstances. Resultant interaction ranges from the highly restricted participant behavior of a computer simulation game through the less inhibited behavior with a so-called "board game" to the flexible, open-ended behavior of role-playing simulation games which allow participant behavior more closely proximate to that in the actual system of interaction being simulated. Whatever the format, inter-personal simulation games combine the competitive aspects of gaming with the reality replication of simulation to allow the participant a personal glimpse of how it "feels" to be in the dynamics of real system inter-personal interaction.[1]

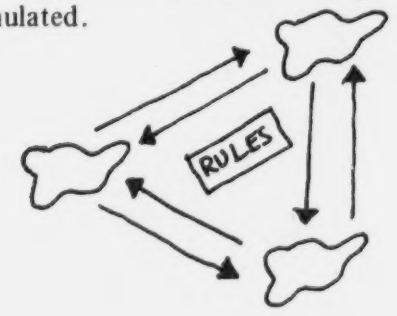


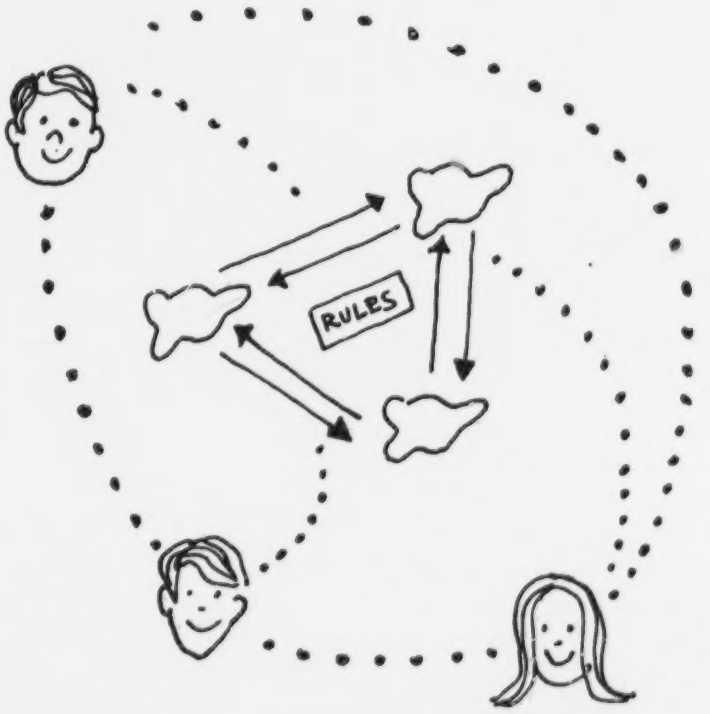
[1]Our categories include simulation/gaming activities most frequently employed in the classroom setting but they are far from inclusive. Other types of inter-personal simulation games which are beginning to find wider usage include media-based training exercises, communication skills exercises and a wide range of exercises and activities for human relations training.

Example: An instructor wishes to illustrate the potential frustrations individuals feel as they grapple with the complexities of trying to redevelop a core area of a central city. Divergent interests guarantee that land cannot serve all equally well—as participants quickly discover when they role-play city councilmen representing various constituencies, indigenous residents resisting external change, businessmen seeking commercial gain, and governmental agencies desiring improvements. Interaction is established by a scenario or background, and is guided by role descriptions and rules or constraints.

- **Large system simulation games** are learning contexts for the examination of the dynamics of complex systems of interaction. Focus may range from looking at the variables affecting the urban community to a thorough-going analysis of the nation-state system of the international community. But, in all cases the participant engages himself in the simulated system—as planner, decision-maker, or merely observer—in order to better comprehend the variables affecting the dynamics of aggregate human behavior within the context of the actual complex system being simulated.

Example: An instructor wishes to demonstrate the principles of controlled growth of a metropolitan area via an examination of an uncontrolled urban system. Participants analyze shortcomings, explore various models for fostering change in the simulated system, make appropriate interventions in the simulation's operations, e.g., alter the political boundaries, foster differential land usage by restructuring the tax system, develop a rapid transit system while levying usage fees on automobiles, zone greenways, and so forth, and determine if "improvement" is forthcoming over time by carefully monitoring such indicators as population trends, housing development (quantity and quality), business activity, and so forth.





Different simulation/gaming activities focus upon different kinds of learning activities and foster correspondingly different learning outcomes. The following table summarizes the characteristics of the four simulation/gaming applications categorized above:

Scale: 1 = Low
5 = High

A COMPARISON OF SIMULATION/GAMING APPLICATIONS

Characteristic	Non-simulation Game	Planning Exercise	Inter-personal Simulation Game	Large System Simulation Game
1. Dependability of learning outcomes	3	2	2	4
2. Ease of adaption	5	4	3	1
3. Degree of teacher centeredness	1	3	3	3
4. Degree of complexity and expense	1	2	2-3	5
5. Peer interaction	4	4	5	1-3
6. Focus on inter-personal and social processes	2	2	5	3
7. Accommodate heterogeneous groups	5	4	4	3
8. Peer feedback/evaluation	5	4	4	2-4
9. Ease of accommodation of various size groups	4	5	3	4
10. Ease of insertion into curriculum	5	5	4	3
11. Cognitive learning outcomes				
A. Facts	5	4	3	5
B. Concepts	5	4	3	4

Characteristic	Non-simulation Game	Planning Exercise	Inter-personal Simulation Game	Large System Simulation Game
C. Generalizations	5	4	3	4
D. Principles	5	3	3	5
E. Drawing analogies	1	3	4	5
F. Identifying strategies	1	3-4	4	5
G. Extrapolating from data	1	4	3	5
H. Interpretation	1	4	4	5
I. Application	1	5	4	4
J. Analysis	1	4	4	5
K. Synthesis	1	4	4	5
L. Evaluation	1	4	4	5
12. Affective learning outcomes				
A. Involvement	5	5	5	5
B. Emotion exhibited	5	3	5	3
C. Perception of others	2	3	5	2
D. Perception of self	3	3	5	3
E. Sense of control	3	3	5	3
F. Attitude toward				
1. Subject	5	5	5	5
2. Instructor	5	5	5	5
3. Peers (playing)	3	2-4	5	3
G. Motivation to participate	5	4	5	4
H. Level of interactions among participants	5	5	5	5

II. SO NOW YOU KNOW?

If simulation/gaming interests you, where is a good place to begin your exploration of these involvement-based techniques? There are literally hundreds of references and sources of information. The eight which are suggested here seem most useful to the novice gamesman. These references provide the most information instructors want to know with the least amount of extraneous or "nice-to-know-but-another time-please" data.

Paul E. Beals, "Games and Simulations," *Grade Teacher,* March 1971, pages 94 and 106.

This brief article asks that you stop and think a moment before you introduce that simulation/game into your program. Will it do the job you want? Beals poses some questions teachers should consider.

Elliot Carlson, *Learning Through Games,* Public Affairs Press, Washington, D.C., 1970, 183 pages ($4.50).

This book is written for the layman to provide a survey of simulation/gaming from the participant's point of view. Nowhere else is the essence of the technique more vitally described. An excellent starting place for those interested in business, political, and social simulation/games to get the "feel" of the technique.

Darrell R. Lewis, and Donald Wentworth, *Games and Simulations for Teaching Economics,* Joint Council on Economic Education, New York, 1971, 66 pages ($1.75).

Prepared primarily for elementary and secondary teachers, this helpful document serves as a guide to games and simulations relating economic concepts. It presents resources on simulation/gaming in general, plus articles and references on use, an annotated survey of selected research, an annotated listing of simulations and games in the social sciences which have economic content, professional organizations in the field, journals and newsletters, and a list of distributors and publishers.

William A. Nesbitt, *Simulation Games for the Social Studies Classroom, 2nd Edition,* The Foreign Policy Association, 345 East 46th Street, New York, 1970, 63 pages ($1).

This easily read little booklet is aimed at the classroom teacher and presents precisely the "what" and "why" of simulation gaming. Included are useful descriptions of some representative classroom games and discussion of the values and limitations of games. The bibliography lists resource persons and organizations, some games, books, articles, reports, and films on simulation.

Simulation/Gaming/News, Simulation/Gaming/News, P.O. Box 8899, Stanford University, Stanford, California 94305 ($4 for five issues: every other month except in the summer).

This tabloid-style, informal publication provides readers with practical, "applicable" information in addition to more theoretical considerations. It treats the application of simulation and gaming in most areas of experience and at different educational levels.

Social Science Education Consortium, Inc., *Social Studies Curriculum Materials Data Book,* 970 Aurora, Boulder, Colorado 80302, 202 pages ($20; $26 with October 1971 supplement).

This manual provides analyses of curriculum materials that will allow administrators, curriculum coordinators, methods teachers, and classroom teachers to select materials which are appropriate to their needs and situation. Materials reflect the three major categories of innovative social studies curriculum materials which have been produced in the last decade—project materials, textbooks, and games and simulations. Each of the data sheets on simulations and games are one-to-two page analyses and include the following information: 1) overview of significant features of the materials; 2) description of format and cost; 3) suggested time necessary for implementation; 4) intended user characteristics; 5) rationale and general objectives; 6) description of content; 7) primary teaching and gaming procedures; and 8) evaluative data, comments, and suggestions for use of the materials. Supplements to the data book appear twice a year, and present data sheets are revised as necessary. Forty-four games are analyzed. In addition, 160 games are listed in an abbreviated game and simulations guide.

Clarice Stoll, "Games Students Play," *Media and Methods,* October 1970, pages 37-40.

This brief review of simulation/gaming assumes only that the reader has an interest in the field. It addresses straightforwardly the following questions and concerns: "What is a simulation game?," "Should you use simulations?," "How to start," "Playing," and provides a brief annotated listing of selected games.

David Zuckerman, and Robert Horn, eds., *The Guide to Simulations Games for Education and Training, 2nd Edition,* Information Resources, Inc., Lexington, Massachusetts, in press, expected publication date January 1973 (about $15).

Originally published in 1970, the Guide has established itself as a valuable source book of educational simulation/gaming information. The first edition contained annotated descriptions of over 400 simulations and games that could be used by elementary

and secondary schools, colleges, vocational schools, graduate schools, and industrial training groups. The exercises are indexed both by target population and affiliation, producer, distributor, kinds of components, supplementary material needed, number of players (maximum and minimum), cost, and availability. Some entries are designed to help consumers decide on the value of an exercise for their own particular instructional goals. These entries include the roles and objectives of the players, major decisions made in the game, and stated training goal.

III. SO NOW YOU'RE AN OLD HAND?

This section has been prepared for the newly-educated novice, or the old hand who needs materials to give someone who wants to begin an in-depth study of simulation/gaming. These references cover a variety of subjects, from man-machine applications to bibliographies especially useful to the graduate student writing a dissertation.

Dennis Benson, *Gaming: The Fine Art of Creating Simulation/Learning Games for Religious Education,* Abington Press, 201 8th Avenue South, Nashville, Tennessee, 1971, 64 pages ($5.95).

A combination text-and-record discussion of how to design games. Eleven games are included–seven in full detail and four with less elaborate explanations. Of particular interest to religious educators and others who wish to examine ethical considerations in social contexts.

Sarane S. Boocock, and E. O. Shild, eds., *Simulation Games in Learning,* Sage Publications, Inc., 275 South Beverly Drive, Beverly Hills, California 90212, 1968, 279 pages ($8.95).

A valuable compendium of articles on simulation/gaming in the social sciences. Discussions include the rationale for the use of simulation/gaming, their impact, the parameters which may affect the impact of simulation games, and perspectives for the future.

Donald R. Cruickshank, *Simulation as an Instructional Alternative in Teacher Education,* Association of Teacher Educators, Washington, D.C.; ERIC Clearinghouse on Teacher Education, Washington, D.C., 1971, 33 pages. ATE Research Bulletin No. 8, Publication-Sales Section, NEA, 1201 16th Street, N.W., Washington, D.C. 20036 (Stock No. 868-24462; $1.25, quantity discounts). Also available as ED 053 067 from the ERIC Document Reproduction Service, P.O. Drawer O, Bethesda, Maryland 20014, in microfiche for 65c and hardcopy for $3.29.

This paper examines several of the better known developments in the field of simulation as an instructional alternative in teacher education. Examples of simulation in preservice and inservice teacher education are described. Each description includes information on the purpose and form of the simulation, how to use it, its specific advantages and drawbacks, and whom to contact for further information. Some examples are 1) classroom simulator, 2) teaching problems laboratory, 3) low-cost instructional simulation, 4) human relations: one dimension of teaching, and 5) inner-city simulation laboratory. The booklet discusses the general advantages of simulation and the specific advantages of using it in conjunction with student teaching, as part of the college-based teacher education program, and in inservice and graduate education. The report also outlines briefly several questions which should be considered in deciding whether or not to use a particular simulation.

Alice Kaplan Gordon, *Games for Growth,* Science Research Associates, Inc., Palo Alto, California, 1970, 205 pages ($4.25).

This book explores the history of simulation/gaming and its current uses. It includes specific descriptions of some available games, suggestions for classroom use, guidelines on game design and adaptation, and a discussion of game evaluation. A bibliography of selected available games is included.

Robert G. Graham, and Clifford F. Gray, *Business Games Handbook,* American Management Association, Inc., New York, 1969 ($22).

This book is divided into three parts: 1) readings to introduce the concept of simulation gaming; 2) abstracts of general purpose, special purpose, and industry games currently being used; and 3) a bibliography which includes articles and books on business games. The game abstracts are especially useful as they include game descriptions, training purpose, decisions made by participants and game administrators, method of administration (manual or computer), and source of information. Written for company personnel managers, teachers, training directors, and management consultants.

Paul S. Greenlaw, Lowell W. Herron, and Richard H. Rawdon, *Business Simulation in Industrial and University Education,* Prentice-Hall, Englewood Cliffs, New Jersey, 1962, 356 pages ($10).

Provides helpful guidance and a comprehensive source of information on the design, administration and educational uses of business simulations, both in university curricula and in the management training programs of industry. A basic book in the field.

John R. Raser, *Simulation and Society: An Exploration of Scientific Gaming,* Allyn and Bacon, Boston, Massachusetts, January 1969, 180 pages ($2.95).

This is an attempt to write "the complete book on simulation." Part I begins by giving the reader a feel for simulation in general, and then delves into the simulation of social systems–a discussion that is somewhat technical in places yet remains a lucid and readable discussion of modeling and information theory.

Part 2 looks at some specific functions that gaming and simulation perform in theory construction and in instruction. The book concludes with a section on the scientific validity of games. It is primarily aimed at the social scientist who may not be familiar with simulation. The educator will find some sections useful, particularly the chapter on games for teaching.

Clarice Stoll, and Michael Inbar, *Simulation and Gaming in Social Science,* Free Press, New York, 1972, 313 pages ($10.95).

This book is written for a general audience as an introduction to various simulation techniques (teaching or research, computer or non-computer). It includes six "textbook chapters" written by Inbar and Stoll, and 12 chapters by contributors. Included is a discussion of the history of simulation, and descriptions of several simulations (e.g., SIMSOC, Life Career, International Simulation (INS), Consumer, Cariboo Hunting Games).

Clarice Stoll, and Samuel A. Livingstone, *Simulation Games for the Social Studies Teacher,* Free Press, New York (in press, anticipated release date, Spring 1973).

A short practical handbook written for the classroom teacher, K-12. It includes excellent discussions of how to design a simulation game, written in unsophisticated language, and how to use games and incorporate them with other materials into the classroom. It also has a section devoted to conclusions of research to date.

P. J. Tansey, ed., *Educational Aspects of Simulation,* McGraw-Hill, Maidenhead, Berkshire, England, 1971, 274 pages (4.70 English pounds).

This reference book covers a number of aspects of simulation and gaming as they relate to education. Chapters include:

"Some Examples of Programed Non-Simulation Games: WFF'N PROOF, On Sets and Equations" (Layman E. Allen)

"Crisis Decision Making and Simulation" (Robert C. Boardman and C. R. Mitchell)

"Teacher Education Looks at Simulation: A Review of Selected Uses and Research Results" (Donald R. Cruickshank)

"Simulation: A Catalog of Judgments, Findings and Hunches" (Dale M. Garvey)

"An Introduction to the Virtues of Gaming" (Fred Goodman)

"Simulation in International Relations" (Paul Smoker)

"A Primer of Simulation: Its Methods, Models, and Application in Educational Processes" (P. J. Tansey)

"Simulation and Media" (Paul A. Twelker)

"Simulations and Games: Descriptions and Sources" (Derick Unwin)

"The Role of Simulation and Games in the Development of Geography Teaching" (Rex Walford)

"SAM (Simulated Arithmetic Machine): A Computer Programming and Operation Simulation" (Roy T. Atherton).

Paul A. Twelker, *Instructional Simulation: A Research Development and Dissemination Activity,* Teaching Research Division, Oregon State System of Higher Education, Monmouth, Oregon, February 1969, 236 pages. Available as ED 032 657 from the ERIC Document Reproduction Service, P.O. Drawer O, Bethesda, Maryland 20014, in microfiche for 65c and hardcopy for $9.87.

A broad examination of theoretical issues of instructional simulation. Among the chapters, "Simulation: An Overview" furnishes the reader with a broad look at the field of simulation, provides a rationale and conceptual framework for subsequent discussions, and discusses many of the more important issues in the design and use of simulation. "The Design of Instructional Systems" presents a 13-step model of simulation design application of simulation in both school and non-school settings (e.g., the military, business, and government). In "Simulation in Vocational Education" the important contributions of the military to simulation for vocational training are discussed in the light of civilian occupational training. And finally, "Situational Response Testing: An Application of Simulation Principles to Measurement" gives attention to the use of simulation for measurement purposes. The appendices include listings of independent and dependent variables involved in learning game design, the four issues of the *Instructional Simulation Newsletter* published during the project, and some suggested new directions for games and simulation. Extensive reference lists are provided.

Paul A. Twelker, ed., *Instructional Simulation Systems: An Annotated Bibliography,* Continuing Education Publications, Waldo Hall 100, Corvallis, Oregon, 1969, 286 pages ($6.75).

This document lists about 1500 references on simulation and gaming and includes annotations or abstracts for the majority of the listings. The material is drawn from both published and unpublished documents and from civilian, military, and industrial sources. Simulation exercises and games are described in a special format to indicate the subject, learner population, price

(if any), materials furnished, and other relevant information. The bibliography lists references through 1968 and purposely omits many of the older articles that are cited elsewhere, unless they appear to be classics in their field. Some references refer to instructional systems design, computer-assisted instruction, and programed instructional simulation systems. An extensive, easy-to-use subject index is provided that allows instant perusal of titles and authors. This document is for the serious student of simulation in that it references the broad field of simulation and gaming in education, the social and behavioral sciences, the social studies, business, and research in all areas.

Journals and Newsletters

James S. Coleman, and Keith J. Edwards, *Simulation and Games: An International Journal of Theory, Design, and Research* (Johns Hopkins University), Sage Publications, 275 South Beverly Drive, Beverly Hills, California 90212 ($18 per year, quarterly, professional discounts available).

This journal provides a forum for theoretical and empirical papers related to simulations (man, man-machine, and machine) of social processes. It publishes theoretical papers concerned with the use of simulation for research and instruction, empirical studies, and technical papers about new gaming techniques. Book reviews, listings of newly available simulations, and short simulation reviews are included.

S^3–Simulation in the Service of Society, Simulation in the Service of Society, P.O. Box 994, La Jolla, California 92037 ($12 per year, twelve issues).

This newsletter provides information for scientists and laymen concerned with problems of society and the use of computers to model and study alternative courses of action and their possible consequences. Its format includes monthly *Our Bookshelf and Beyond, Calendar of Activities, Others Concerned,* and *Thoughts in the Mail.*

IV. OTHER OLD HANDS

The following groups represent some of the older and nationally recognized centers of activity in simulation/gaming as well as some newer and less well-known groups. Our criteria for including groups were:

1) The group was known to exist at the time the paper was written;

2) The group could be of some help to individuals who take the time to request information or services;

3) The group clearly is not limited to publishing simulation/gaming exercises only.

Consequently, this list represents our information bias. Surveys were sent to groups that had been listed in several previously published lists with which we were familiar. Some will have been overlooked. Purposely omitted were many independent consultants. We consider this list a place to begin your search, not an exhaustive list of all known centers of expertise.

Name (Address and contact follow in separate list)	Status	Activities: Develop	Sell	Train	Research	Disseminate Information, Literature Materials	Level	Area/ Focus
Academic Games Associates, Inc.	Private Corp.	x	x	x			Elementary through Adult	General
Academic Games Program Center for Social Organization of Schools, The Johns Hopkins University	University related Department				x	x	Elementary through Adult	Social Science
American Educational Research Association–Special Interest Group on Simulation	Professional Society					x	General	General
American Games Assoc.	Assoc.					x	All	General
Behavioral Sciences Laboratory The Ohio State University	University related Department	x	x	x	x		College	International Relations
Behavioral Simulation and Gaming Group Political Science Department Temple University	University related Project	x		x	x	x	College	Pol. Sci. Intern. Relations Urban Analysis and Planning
Berkshire College of Education	University related Department	x		x		x	Secondary	Social Education
Center for Computer-Based Behavioral Studies Department of Psychology Univ. of Calif. at Los Angeles	University related Dept. and Project	x			x		College Graduate	Interparty and International Conflict
Center for Economic Education University of Minnesota	University related Center	x		x	x	x	Elem., Secondary, College	Economics
Center for Mediation and Conflict Resolution	Nonprofit Corp.	x		x		x	Public	Dispute Resolution Techniques
Center for Simulation Studies	Nonprofit	x	x	x	x		High School, College, Post-College	Urban Affairs

Name (Address and contact follow in separate list)	Status	Activities: Develop	Sell	Train	Research	Disseminate Information, Literature Materials	Level	Area/ Focus
Center for Urban Studies Department of Urban Planning Wayne State University	University related Dept.	x		x	x		College Professional	Urban Studies
Community Crisis Intervention Project	University related Dept.	x				x		Conflict Resolution Social Change
Didactic Systems, Inc.	Private Corp.	x	x	x			General	General
Ecumenical Simulation Sharing Service	Informal Group	x	x	x		x	Secondary through Adult	Religious Education
Educational Games Consultants for Social Sciences	Unincorporated Firm			x	x		Elementary Secondary	Social Studies
Educational Games Company	Unincorporated Firm	x	x		x		Upper Elem. through Adult and Spec. Ed.	Social Studies Driver Educ. Career Dev.
Environmental Simulation Laboratory University of Michigan	University related Dept.	x	x	x	x	x		
Environmental Studies Division Environmental Protection Agency	Federal Agency	x					Public	Environmental Studies
Games Central (Abt Associates)	Private Corp.	x	x	x	x	x	Upper Elem. through Adult	Social Studies Math Language Arts
Harwell Associates	Unincorporated Firm	x	x	x	x		Secondary; College; Professional	Community Planning
Information Resources, Inc.	Private Corp.	x				x	Adult	Decision-making
Institute for Simulation Analysis	Nonprofit Institute	x		x			College Adult	Urban Planning
Instructional Simulations, Inc.	Private Corp.	x	x	x	x	x	Secondary through Adult	Social Studies

Name (Address and contact follow in separate list)	Status	Activities: Develop	Sell	Train	Research	Disseminate Information, Literature Materials	Level	Area/ Focus
Interact	Unincorporated Firm	x	x				Elementary Secondary	Social Studies English
International Institute for Organizational and Social Development	Private Corp.	x	x	x	x	x	Adult	Organizational Development
International Relations Program–Syracuse University	University related Dept.	x	x	x	x		College	International Relations Politics
International Simulation and Gaming Association	Informal Group					x	Secondary through Adult	General
Kansas Educational Simulation Center–Kansas State Teachers College	University related Dept.	x		x	x	x	Elementary Secondary	Social Studies
Learning Games Associates	Unincorporated Firm	x	x	x			Kindergarten Through College	Math, Logic Sciences Soc. Sci. Lang. Arts
National Academic Games Project	Nonprofit Corp.	x	x	x	x	x	Elementary through Adult	General
National Gaming Council	Professional Society					x	Elementary through Adult	General
Polis Laboratory University of California at Santa Barbara	University related Dept.	x			x		College	Politics
Prince Analysis Inc.	Private Corp.	x	x	x	x		College; Adult	General
Maria Grey College	University related Dept.	x	x	x	x	x	Secondary College	Social Studies
School of Journalism University of Iowa	University related Dept.	x		x	x	x	College	Journalism Communications

Name (Address and contact follow in separate list)	Status	Activities: Develop	Sell	Train	Research	Disseminate Information, Literature Materials	Level	Area/ Focus
SIMILE II	Private Corp.	x	x	x	x		Elementary through College	Social Studies
Simulation Councils, Inc.	Technical Society					x	Professional	Computer Modeling
Simulation Games Center	Nonprofit Corp.	x	x	x		x	Secondary	General Christian Educ. Church Develop.
Simulation/Gaming/News	Company					x	All	General
Simulation Learning Institute	Unincorporated Firm		x	x		x	Adult	General
Simulation of International Processes–Northwestern University	University related Dept.				x			International Systems
Simulation Systems Program United States International University	University related Dept.	x	x	x	x	x	Elementary through Adult	Social Studies Multidisciplinary Studies Professional Education
Social Science Education Consortium, Inc.	Nonprofit Corp.			x		x	Elementary through Adult	Social Studies
Social Systems Simulation Group	Unincorporated Firm	x	x		x	x		Social Systems
Sonoma State College SimLab	University related Project	x		x	x		Elementary through Adult	Social Studies
Student Instructional Gaming Network (SIGN) Project	University related Dept.	x		x	x	x	Elementary	Math, Lang. Arts, Sci. Logic Social Studies
Systems and Economic Division Planning and Research Corp.	Private Corp.	x	x	x	x		College Adult	Urban Planning

Name (Address and contact follow in separate list)	Status	Activities: Develop	Sell	Train	Research	Disseminate Information, Literature Materials	Level	Area/ Focus
Tek-Dayme Research Associates	Nonprofit Corp.	x	x		x	x	College; Adult	Global & Urban Simulation
URBANDYNE, Inc.	Private Corp.	x	x	x			Secondary; College; Adult	Ecology Urban Affairs Higher Educ. Soc. Studies Church Affairs
Urbex Affiliates, Inc.	Private Corp.	x	x				Secondary College Adult	Urban Affairs
World Simulation Organization	Autonomous Affiliate of Simulation Councils, Inc.			x		x	Professional	Social Problems

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